average of twenty-nine days, with the extremes lying between seven days and ninety days. Contrary to expectations, none of them showed dermatitis venenata, a thing which one would expect with the strongly alkaline reaction of sodium borate, aluminum silicate, and magnesium carbonate. No irritation was found. Universally the patients stated a beneficial effect in their itching symptoms.

COMMENT

I take the definite stand that this type of treatment should be reserved for the dry or completely uncomplicated cases. It still remains to demonstrate in the future how well the average results will show up when eczematous changes are included, *i. e.,* raw, denuded areas and weeping dermatitis venenata.

This type of treatment offers great advantage in producing prolonged exposure to a fungicide which, in itself, seems to be physiological in its action on the fungus, namely, sodium borate. Theoretically the fungus would absorb this chemical up to saturation point, which has not been accurately decided upon.

The combination of sodium borate with hygroscopic powders eliminates moisture which favors growth of fungi. The addition of talcum is observed to support the same. The use of soaks facilitates the quick absorption of the chemical by the fungus and penetration of dead tissue. Presumably, normal skin tissue does not absorb boron; only dead, desquamating epithelium. The alkaline reaction, together with the inherent quality of the chemical and the drying effect will all three combine together in favor of healing. In order to confirm the clinical results, a few cultures were inoculated on routine Sabouraud's medium and treated with sodium borate 1-100, 1-1000, and 1-10,000. It seemed obvious that the sodium borate-treated media inhibited growth in comparison with non-treated media which favored normal growth. Too small a series, however, is available for accurate estimation of this side and will be supplemented later on.

In this series are cases which were previously treated by other means and methods, with ill effects or no results. It seems certain, however, that a judicial application of this treatment, even in complicated cases, acts well. Also, here I should like to add that only the skilled dermatologist who can judge each individual case should attempt the complicated cases. For example, where pruritus ani or vulva were present I wish to emphasize the unquestionable value of this treatment schedule added to other known approaches, such as x-ray, etc. Unnecessary to say that a condition like pruritus vulva would have lichenification and secondary effects besides its own etiology, which would require a definite approach. Weeping eczemas would require alleviation of the acute symptoms first.

Other variations and additions of boron preparations were found unfavorable in comparison. Sodium perborate, as found in commercial powders, did not add to the fungi-static power of this régime; it would tend to irritate the treated areas. Other commercial powders claim their action from the alkaline reaction they possess.

One factor should be clearly understood: that many patients show a constant tendency to recurrence of their once-healed infections. Some physicians even go so far as to state that an epidermophytosis will never be 100 per cent healed, but will continue for the rest of a person's life.

SUMMARY

1. Two hundred and two cases of epidermophytosis of the feet, groins, anal region and axilla, as well as the body, have been treated with sodium borate in powder form and soaks.

2. The response, comparing very favorably with hitherto known methods, is reported.

3. For the chronic forms of epidermophytosis of the feet, groins, and axilla, it seems a method of choice.

4. No instance of dermatitis venenata was encountered in the uncomplicated cases.

5. This method used in complicated, eczematous and weeping forms should be applied with extreme caution, and only in the hands of the experienced dermatologist.

6. Epidermophytosis of the skin folds, excluding the feet, shows a longer healing course, although comparing very favorably with other methods in use.

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PREMATURE OBSTETRICAL DELIVERY DUE TO POLIOMYELITIS*

WITH RESPIRATORY PARALYSIS COMPLICATION

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BECAUSE of the unusual circumstances associated with the successful termination of a spontaneously premature labor, this report is submitted in order to render an opinion regarding the advantages of a properly developed chest respirator for any case of respiratory paralysis

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REPORT OF CASE

CASE 1.—The patient, V. M., a 22-year-old white female, gravida iii, expecting confinement on August 27, 1940, in her last trimester of an uneventful pregnancy, on July 19, 1940, developed marked lassitude, anorexia, continuous frontal headache, and moderately severe lumbosacral backache. She attributed this to her pregnancy and did not call her physician. The following day the symptoms were markedly exaggerated, and, in addition, the patient noted "crampy" sensations in her legs.

On July 21, due to intense lumbar pain and extreme weakness of both legs, the patient was admitted to the maternity service of a local hospital. Following a diagnostic lumbar puncture, she was transferred to the Communicable Disease Unit of the Los Angeles County Hospital in the afternoon of July 22. The history was verified, in addition to which it was learned the patient had been rather drowsy since onset. Past history was irrelevant, except that she had previously had two normal spontaneous deliveries, with episiotomy, the larger child weighing seven pounds six ounces. No history of contact was obtained, but it was learned later that eleven days prior to the onset of symptoms both her children had been feverish, anorexic, drowsy and irritable, and had loose bowel movements, but regained normal health within a few days.

On admission the temperature was 101.4 degrees Fahrenheit, pulse 112, and respirations 28 per minute. The patient was a slender, well-developed female adult, lethargic but quite alert when aroused. Pertinent findings included moderate pharyngeal injection, marked nuchal rigidity in the last 30 degrees of flexion, and an abdomen enlarged to the size of an eight-month pregnancy. Fetal movements could be seen and felt, and the fetal heart tones were of good quality. Due to the condition of the patient at the time of admission, and in view of the previous normal obstetrical history, no further obstetrical examination was made. The extremities were normal and without edema. There was marked weakness of the flexor and extensor muscle groups of both arms and of the small muscles of the right hand. Paralysis of the flexor and extensor groups of both legs was noted, with marked paresis of the internal and external rotators. Examination of the cranial nerves and sensation was normal. The spine sign, Brudzinski, and Kernig reflexes were positive. Tendon reflexes of the upper extremities were normal. The superficial abdominal and gluteal reflexes, and the deep tendon reflexes of the lower extremities were absent. Babinski response was normal.

Hemoglobin was 90 per cent (Sahli), leukocytes 9,200, with a differential of 86 polymorphonuclear and 14 mononuclear cells. Blood Wassermann and Kahn were negative. Examination of the spinal fluid revealed a water pressure of 100 millimeters. The Queckenstedt test was active bilaterally. The fluid was ground-glass in appearance, and contained 900 cells: 95 per cent lymphocytes and 5 per cent polymorphonuclears. Pandy's test for globulin was negative. Total proteins were 105 milligrams per 100 cubic centimeters. Sugar was qualitatively normal, eight drops of fluid reducing five cubic centimeters of Benedict's solution. Chlorides were normal.

The patient was placed in basket splints and given an intravenous injection of 200 cubic centimeters of human convalescent poliomyelitis serum diluted in 200 cubic centimeters of normal saline, and in addition received indicated symptomatic therapy.

The morning after admission the patient's temperature had returned to normal. On July 25, respiratory distress was noted, which was relieved by assuming the Fowler position. At this time she also developed nausea. The following two days she remained afebrile, but the nausea persisted so that she was unable to take food and required intravenous fluids. On July 26, while still afebrile, the patient again became lethargic, and it was noted that the lower intercostal muscles had become paralyzed. Diaphragmatic function was poor, and breathing was performed chiefly by the use of the upper intercostals and the accessory muscles of respiration.

By midafternoon of July 27, upward extension of the disease had caused markedly increased respiratory embarrassment. The patient became semicomatose and cyanosis appeared. She was placed in a Drinker respirator and showed rapid improvement in color and pulse, but because a fatal outcome seemed probable, a postmortem cesarean section was considered, and would have been done had the need arisen. The fetal heart tones remained of good quality and normal rate. Within a few hours after being placed in the respirator the patient's temperature rose to 102.8 degrees Fahrenheit; the pulse was 90 to 120 per minute. The sensorium cleared, color was good, but pharyngeal paresis became evident, and because of the dysphagia constant suction of mucus from the throat was required.

Uterine contractions first appeared at five- to ten-minute intervals in the early hours of July 28. Active premature labor was definitely established by 10:45 a. m., the pains occurring at three- to four-minute intervals. At this time, because of the apparently inadequate tone and strength of the abdominal muscles, forceps delivery was discussed. By 2 p. m., rectal examination revealed dilatation to 6 centimeters and 50 per cent effacement of the cervix. At 3:50 p. m., the respirator was opened long enough to permit a vaginal examination and rupture of the membranes, under aseptic conditions. During this interval, breathing was maintained by a resuscitator applied to the patient's face. The respirator was again closed, only to be opened again at 4:05 p. m., when perineal bulging was noted. The patient was draped on the respirator bed, and while breathing was maintained by a resuscitator, delivery, without instrumentation, of a normal male infant, weighing six pounds one ounce, was accomplished. A small second-degree laceration of the perineum occurred, but was not repaired, owing to the urgency of returning the patient to the respirator. This was done after the third stage of labor, and following the completion of perineal hygiene, at which time the resuscitator was discontinued. Upon delivery of the child, the patient's breathing immediately improved, evidently because of increased freedom of diaphragmatic motion.

Within twenty-four hours after delivery, the patient became afebrile. The postpartum course was uneventful. She was again able to swallow, and respiratory function returned rapidly, so that the respirator was unnecessary after the eighth postpartum day. Paresis of the upper extremities persisted, but is now less marked, and the paralysis of the lower extremities remains unchanged. The infant has maintained a normal neonatal course on artificial feeding.

COMMENT

We know of no reported case of pregnancy near term complicated by ascending poliomyelitis and respiratory paralysis. Therefore, the management of the case presented a number of rather interesting problems. The mother's condition was so poor that prognosis was bad, and it seemed that a postmortem section might be the only measure that could yield a viable infant. As the patient rallied in the respirator, it then became a matter of terminating the premature labor with the least harm to the mother and baby. Had a properly functioning chest respirator been available, our problem would have been greatly simplified. Picture the difficulty that would have ensued had forceps been required, and low spinal or presacral anesthesia needed for proper relaxation. The question of the anesthetic arose, and, after discussion, it was decided that nothing be used except a small dose of sodium phenobarbital, given hypodermically.

In order to conserve the patient's strength, and because it seemed evident that the abdominal muscles were not functioning sufficiently to aid in

the expulsion of the fetus, it was decided that if forceps were necessary they should be applied in the low or mid-positions. Fortunately, a normal delivery occurred, primarily by uterine effort.

RESPIRATOR HAZARDS

The greatest hazard encountered was that of maintaining the mother's breathing during delivery, for which reason repair of the laceration was not attempted. Such repair is impossible in the chamber type of respirator which encases the entire body. It would have been possible in a chest respirator, provided it were not the type that extends to the hips and covers the entire abdomen.

On a number of occasions in the past we have attempted to use the chest respirator, but in each instance those available have been unsatisfactory, for the reason that they cannot be made to fit the average patient properly, despite the various sizes offered. Furthermore, they exert too much positive pressure as well as negative pressure (thereby quickly fatiguing the patient), and are practically impossible to regulate and so definitely increase the danger of traumatic emphysema and rupture of the lungs.

SUGGESTIONS

It has been our feeling that rather than girdling the chest and abdomen to the level of the iliac crests, the portable chest respirator should be a bivalve affair so fashioned that it may be slipped over the patient's head, covering the shoulders and extending down to the level of the diaphragm. It could be closed by a zipper attachment on each side, and by incorporating an "accordion pleating" effect it could be made to fit the average patient successfully. In this way, even with the enlarged abdomen of pregnancy, a proper fit could be established. The matter of correct pressure regulation is purely mechanical and should be easily overcome. We have just received a newly developed aluminum respirator which, for the most part, embodies these criteria, but as yet have not had the opportunity to evaluate its advantages or shortcomings.

The respirator room, sufficient in size for four patients, such as the one at the Boston Children's Hospital, or the single patient apparatus described by Ewald,[1] would, to a large measure, obviate the need for a portable respirator. However, the expense of installation and maintenance of such equipment, and the still difficult administration of proper nursing care, are two disadvantages which continue to make the portable respirator more desirable.

A properly developed chest respirator would be ideal for patients whose respiratory function is disturbed, not only in such instances as described, but for the decided ease of nursing care and personal comfort of any individual so afflicted as to require long-continued artificial respiration.

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CLINICAL NOTES AND CASE REPORTS

INSULIN TREATMENT IN NONDIABETIC DISTURBANCES*

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THE original use of insulin in the treatment of diabetes mellitus has been extended more and more by some other indications. There is a well-established administration of insulin in the form of shock therapy in the field of psychiatry. Besides, the scope of this summary does not include the treatment of the newborn and infant with insulin, which has become very popular among pediatricians. Furthermore, I want to omit the local treatment with insulin in dermatology, where good results are reported in the administration of insulin on torpid ulcers and skin lesions. The main indication in internal medicine for the administration of insulin in nondiabetic cases is constitutional or acquired leanness.

Sometimes we deal with the simple status hypoplasticus. The inherited deficiency is characterized by symptoms as low-back pain, dysmenorrhea, sterility, habitual abortions. Leanness may be the result of: inadequate food intake; physical overexertion, as everyone knows from his own experience that, being overtired, he loses his appetite, probably due to a reduced secretion of the gastric juice; mechanical obstruction of the gastro-intestinal tract; diseases of the gastro-intestinal tract, as gastritis, peptic ulcer, colitis; acute and chronic infectious diseases; malignancy; advanced arteriosclerosis, from a disturbed circulation in the splanchnic area or due to an impaired nutrition of the cellular structure; endocrine disturbances, as Graves's disease, diabetes, Addison's disease, Simmond's pituitary cachexia; and mental disturbances.

Fundamentally, the loss of weight is the result of an impaired balance between food intake and oxidation. Usually there is a reduction of fat and protein, but the ratio of the loss of fat to the loss of protein may be different. In some cases only the fat deposits disappear, whereas the protein remains unchanged. The classical example is lipodystrophia progressiva. In diabetes and Simmond's disease the loss of protein is preponderant. The daily experience proves that fattening with high-fat and high-protein diet is very difficult, that carbohydrates are essential. The carbohydrate effect is protein economizing, the specific dynamic action of protein is reduced. A perfect insular organ is essential to have an efficient carbohydrate intake, and increased activity of the insular cells initiate a better and faster assimilation of carbohydrates. Insulin increases the craving of the cells for sugar, the cells are able to take more sugar out of the blood and to retain it. The result is increased appetite. It might be presumed that in cases of primary

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